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09/917,400	07/27/2001	Henry A. Hill	11540-005001	2582

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EXAMINER	
YAM, STEPHEN K	

ART UNIT	PAPER NUMBER
2878	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/917,400	HILL, HENRY A.
	Examiner	**Art Unit**
	Stephen Yam	2878

-- The MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-38 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-38 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 14 January 2002 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed July 27, 2001 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. A copy of reference *ALL*- Guerra-"Photon Tunnelling Microscopy" is missing.

2. The information disclosure statement filed July 27, 2001 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered. Translations for references *AZ*- 5-174410 and *AAA*- 5-73980 are missing.

Claim Objections

1. Claims 21, 30-33 and 35 are objected to because of the following informalities:

In Claim 21, lines 4-5, "dielectric material" lacks proper antecedent basis.

In Claim 30, lines 5-6, "multi-element detector" lacks proper antecedent basis.

In Claim 31, line 2, "the photodetector" lacks proper antecedent basis.

In Claim 31, line 3, "detector elements" lacks proper antecedent basis.

In Claim 32, line 5, "the photodetector" lacks proper antecedent basis.

In Claim 33, lines 6-7, "the multi-element detector" lacks proper antecedent basis.

In Claim 33, line 8, "the detector array" lacks proper antecedent basis.

In Claim 35, line 2, "the photo-detector" lacks proper antecedent basis.

In Claim 35, line 3, "detector elements" lacks proper antecedent basis.

In Claim 35, line 4, "the detector array" lacks proper antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2, 3, 5, and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 2 and 38, the phrase "substantially" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 3 is indefinite by virtue of its dependency on an indefinite claim.

Regarding claim 5, the phrase "comparable" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,2, 4, 6, 15, 17-24, 29, 37, and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Ueyanagi et al. European Patent Application EP 0,944,049.

Regarding Claim 1, Ueyanagi et al. teach (see Fig. 15) a multiple source array comprising a reflective mask (6b,7) having an array of spatially separated apertures (aperture within (6b) above (7a)), at least one optic (5, 6a) positioned relative to the mask to form an optical cavity (6), and a source (2) providing electromagnetic radiation to the optical cavity to the optical cavity to excite a mode by the optical cavity to leak (see Paragraph 0039) radiation through the mask apertures towards an object (12).

Regarding Claim 2, Ueyanagi et al. teach the excited mode having transverse dimensions larger than the transverse dimension of each aperture (see Fig. 15).

Regarding Claim 4, Ueyanagi et al. teach each aperture having a transverse dimension (50nm- see Paragraph 0028) smaller than the vacuum wavelength of the source (630nm- see Paragraph 0025).

Regarding Claim 6, Ueyanagi et al. teach the apertures formed by holes (see Fig. 15) in the reflective mask.

Regarding Claim 15, Ueyanagi et al. teach a dielectric material (6a) (see Fig. 2 and 15 and Paragraph 0027) contacting the mask in the cavity.

Regarding Claims 17 and 18, Ueyanagi et al. teach the optical cavity as a linear optical cavity, wherein the at least one optic comprises an optic (see Fig. 15) and the linear optical cavity is formed by two surfaces, the first surface defined by the optic (5) and the other surface being defined by the interface (top of (6b)) between the reflective mask and the dielectric material.

Regarding Claim 19, Ueyanagi et al. teach the dielectric material filling the space between the two surfaces and the first surface defined by the interface between the optic and the dielectric material (between (5) and (6)).

Regarding Claim 20, Ueyanagi et al. teach the optic as a lens (see Fig. 15 and Paragraph 0024).

Regarding Claims 21 and 22, Ueyanagi et al. teach the optic comprising two optics (5 and 6a) and the cavity is a folded cavity formed by three surfaces (see Fig. 15), the first surface defined by the first optic (5), the second surface defined by the second optic (6a), and the third surface defined by the interface between the reflective mask (7) and a dielectric material (6a), wherein the folded cavity is defined by the first and second surfaces.

Regarding Claims 23 and 24, Ueyanagi et al. teach the optic comprising two optics (5 and 6a) and the cavity is a ring cavity formed by three surfaces (see Fig. 15), the first surface defined by the first optic (5), the second surface defined by the second optic (6a), and the third surface defined by the interface between the reflective mask (7) and a dielectric material (6a).

Regarding Claim 29, Ueyanagi et al. teach the optic positioned relative to the mask to form a stable optical cavity with the mask (see Fig. 15).

Regarding Claim 37, Ueyanagi et al. teach (see Fig. 15) a source for illuminating an object (12) comprising a reflective mask (6b, 7) comprising at least one aperture (7a), and at least one optic (5, 6a) positioned relative to the mask to form a stable optical cavity (6) with the mask, wherein during operation a portion of electromagnetic energy built-up in the cavity couples (see Paragraph 0039) through the mask towards the object.

Regarding Claim 38, Ueyanagi et al. teach (see Fig. 15) a method for illuminating an object (12) with multiple sources (2b'), comprising resonantly exciting a mode of a stable optical cavity (6) and coupling electromagnetic radiation out of the optical cavity towards the object through an array of apertures (7a) in one of the optics (7) that define the cavity, wherein the transverse dimensions of the excited mode are larger than a transverse dimension of each aperture (see Fig. 15).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 3 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueyanagi et al.

Regarding Claim 3, Ueyanagi et al. teach the array as taught in Claim 1, according to the appropriate paragraph above. Ueyanagi et al. teach the aperture as having transverse dimensions

of 50nm (see Paragraph 0028). Ueyanagi et al. do not teach the transverse dimensions of the excited mode more than 50 times larger than the transverse dimension of each aperture. It is well known in the art that a laser beam emitted from a common laser device is approximately 5mm in width, more than 50 times larger than 50nm. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an excited mode with transverse dimensions more than 50 times larger than the transverse dimension of each aperture in the array of Ueyanagi, to use affordable laser components to lower the cost of the source array system.

Regarding Claim 16, Ueyanagi et al. teach the array as taught in Claim 15, according to the appropriate paragraph above. Ueyanagi et al. also teach the dielectric material as a lens. Ueyanagi et al. do not teach the dielectric material as an Amici lens. It is design choice to use an any type of lens in a source array. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an Amici lens in the array of Ueyanagi et al., to utilize the specific properties of an Amici lens for defining the light through the optical cavity.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueyanagi et al. in view of Ebbesen et al. US Patent No. 5,973,316.

Ueyanagi et al. teach the array as taught in Claim 1, according to the appropriate paragraph above. Ueyanagi et al. also teaches using light of 630nm wavelength (see Paragraph 0025). Ueyanagi et al. does not teach each aperture having a transverse dimension comparable to the wavelength of the source electromagnetic radiation. Ebbesen et al. teach (see Fig. 10a) a reflective mask having an array of spatially separated apertures wherein each aperture is 500nm in diameter (see Col. 7, lines 19-27). It would have been obvious to one of ordinary skill in the art

art at the time the invention was made to use the aperture dimensions of Ebbesen et al. in the array of Ueyanagi et al., to enhance and provide light of appropriate width for photolithography (see Col. 3, lines 8-13).

6. Claims 7-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueyanagi et al. in view of Joannopoulos et al. US Patent No. 5,784,400.

Regarding Claim 7, Ueyanagi et al. teach the array as taught in Claim 1, according to the appropriate paragraph above. Ueyanagi et al. does not teach the apertures formed by dielectric regions in the reflective mask. Joannopoulos et al. teach an optical cavity with a reflective mask (502) (see Fig. 5) with the apertures formed by either holes (504) (see Fig. 5 and Col. 4, lines 39-41) or dielectric regions (604) (see Fig. 6 and Col. 4, lines 58-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the apertures by dielectric regions as taught by Joannopoulos et al. in the array of Ueyanagi et al., to provide a filled waveguide to confine the light passing through each aperture to enhance light output.

Regarding Claim 8, Ueyanagi et al. teach the array as taught in Claim 1, according to the appropriate paragraph above. Ueyanagi do not teach each aperture comprising a dielectric region defining a waveguide having transverse dimensions sufficient to support a propagating mode of the electromagnetic radiation, wherein the waveguide couples the electromagnetic energy built-up in the cavity between opposite sides of the mask. Joannopoulos et al. teach an optical cavity with a reflective mask where each aperture comprises a dielectric region (604) (see Fig. 6) defining a waveguide having transverse dimensions sufficient to support a propagating mode of the electromagnetic radiation, wherein the waveguides couple the electromagnetic energy built-

up in the cavity between opposite sides of the mask (see Col. 3, lines 57-61 and Col. 4, lines 45-47- total internal reflection (TIR) maintained through each waveguide). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a dielectric region defining a waveguide as taught by Joannopoulos et al. in the multiple source array of Ueyanagi et al., to provide a filled waveguide to confine the light passing through each aperture to enhance light output.

Regarding Claims 9 and 10, Ueyanagi et al. in view of Joannopoulos et al. teach the array as taught in Claim 8, according to the appropriate paragraph above. Ueyanagi et al. also teach (see Fig. 15) the reflective mask further comprising an end mask portion (7) adjacent the object, wherein each aperture further comprises a secondary aperture (aperture (7a) within (7)) formed in the end mask portion and aligned with the light. Regarding Claim 10, Ueyanagi et al. teach the transverse dimension of each secondary aperture (50nm- see Paragraph 0028) smaller than the vacuum wavelength of the source (630nm- see Paragraph 0025). Ueyanagi et al. and Joannopoulos et al. do not teach the secondary aperture having a transverse dimension smaller than the transverse dimension of a corresponding waveguide. It is well known in the art to use a smaller aperture to confine emitted light, so that a precise narrow beam of light is used to excite a particular area of a sample. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a second smaller aperture in the device of Ueyanagi et al. in view of Joannopoulos et al., to further confine the light to narrow the width of the emitted light beam.

Regarding Claims 11, 13, and 14, Ueyanagi et al. (and Joannopoulos et al. for Claim 11) teach the multiple source array as taught in Claims 1 and 9, according to the appropriate

paragraph above. Ueyanagi et al. also teach and the end mask portion comprising a metal layer ("Titanium"- see Paragraph 0028). Ueyanagi et al. and Joannopoulos et al. do not teach a reflective dielectric stack surrounding the waveguides. It is well known in the art to surround a waveguide with a dielectric stack and anti-reflection coating to seal an optical cavity to prevent light from escaping through the waveguide or leaking onto the object. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a dielectric stack and anti-reflection coating in the array of Ueyanagi et al. (in view of Joannopoulos et al. for Claim 11), to assist the waveguide in confining and propagating the light from the laser through the apertures to prevent external light leakage.

Regarding Claim 12, Ueyanagi et al. in view of Joannopoulos teach the multiple source array as taught in Claim 8, according to the appropriate paragraph above. Ueyanagi et al. and Joannopoulos do not teach the waveguide defining a second optical cavity resonant with the propagating mode of electromagnetic radiation. It is well known in the art to use multiple optical cavities to obtain a higher optical power through a greater amount of total resonance. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the waveguide for a second optical cavity in the array of Ueyanagi et al. in view of Joannopoulos, to provide greater output optical power without significantly increasing the beam width.

7. Claims 25, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueyanagi et al. in view of Mongeon et al. US Patent No. 4,592,058.

Regarding Claim 25, Ueyanagi et al. teach the multiple source array as taught in Claim 1, according to the appropriate paragraph above. Ueyanagi et al. do not teach an active feedback

system for maintaining the resonance between the optical cavity and the electromagnetic radiation provided by the source. Mongeon et al. teach (see Fig. 1) an active feedback system for an optical cavity (5, 7) comprising an active feedback system (9, 11, 15, 17, 19, 21, 23) for maintaining the resonance in the optical cavity and the electromagnetic radiation provided by the source (3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an active feedback system as taught by Mongeon et al. in the array of Ueyanagi et al., to negate the effects of temperature changes on the resonance effects of the optical cavity as taught by Mongeon et al. (see Col. 2, lines 55-59).

Regarding Claim 26, Ueyanagi et al. and Mongeon et al. teach the multiple source array as taught in Claim 25, according to the appropriate paragraph above. Ueyanagi et al. do not teach an electronic controller to change the wavelength of the electromagnetic radiation. Mongeon et al. teach the active feedback system comprising an electronic controller (23) that causes the source to change the wavelength of the electromagnetic radiation in response to a servo signal (33) derived from a portion of the electromagnetic radiation (into (15)) reflected from the optical cavity. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an electronic controller as taught by Mongeon et al. in the array of Ueyanagi et al., to negate the effects of temperature changes on the resonance effects of the optical cavity as taught by Mongeon et al. (see Col. 2, lines 55-59).

Regarding Claim 28, Ueyanagi et al. and Mongeon et al. teach the multiple source array as taught in Claim 25, according to the appropriate paragraph above. Ueyanagi et al. do not teach a transducer to dither a coupled optic. Mongeon et al. teach the active feedback system comprising an transducer (9) coupled to one of the optics (7) that form the optical cavity and an

electronic controller (23) that causes the transducer to dither (see Col. 2, lines 30-46) the coupled optic in response to a servo signal (33) derived from a portion of the electromagnetic radiation (into (15)) reflected from the optical cavity. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a transducer and electronic controller as taught by Mongeon et al. in the array of Ueyanagi et al., to provide an easily-constructed component of compensating for the effects of temperature changes on the resonance effects of the optical cavity as taught by Mongeon et al. (see Col. 2, lines 55-59).

8. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueyanagi et al. in view of Mongeon et al. as applied to Claim 25, further in view of Palmer US Patent No. 6,201,820.

Ueyanagi et al. and Mongeon et al. teach the multiple source array as taught in Claim 25, according to the appropriate paragraph above. Ueyanagi et al. also teach (see Fig. 15) a dielectric material (6b) at least partially filling the optical cavity. Ueyanagi et al. and Mongeon do not teach a temperature controller and electronic controller to change the temperature of the dielectric material. Palmer teaches a laser with an optical cavity (see Col. 7, lines 3-6) with an active feedback system comprising a temperature controller (20) (see Fig. 1) coupled to the optical cavity and an electronic controller (18) that causes the temperature controller to change the temperature of the optical cavity in response to a servo signal (see Col. 2, lines 35-47) derived from the electromagnetic radiation reflected (into (28) and (30)) from the optical cavity. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the temperature controller and electronic controller of Palmer in the multiple source array

of Ueyanagi et al. in view of Mongeon et al., to provide a durable method of maintaining a stable resonant frequency and a constant optical cavity length without fragile, moving parts.

9. Claims 30, 31, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueyanagi et al. in view of Krantz US Patent No. 6,248,988.

Regarding Claim 30, Ueyanagi et al. teach the multiple source array as taught in Claim 1, according to the appropriate paragraph above. Ueyanagi et al. do not teach a microscopy system also comprising a multi-element photo-detector and an imaging system to return electromagnetic radiation leaked to the object and scattered/reflected back through the apertures. Krantz teaches (see Fig. 15) a microscopy system comprising a source (235), multi-element photo-detector (244,252), aperture array (239) (see Col. 13, lines 40-42), and imaging system (243, 251) positioned to direct a return beam to the multi-element detector, wherein the return beam comprises electromagnetic radiation leaked to the object (250) and scattered/reflected back through apertures (244',252'). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the multi-element photo-detector and imaging system of Ishihara with the multiple source array of Krantz, to provide a narrow-beam light source to provide a higher precision of microscopy scanning.

Regarding Claim 31, Ueyanagi et al. and Krantz teach the microscopy system as taught in Claim 30, according to the appropriate paragraph above. Krantz also teaches a pinhole array (244',252') adjacent the photo-detector (see Col. 13, lines 33-37), wherein each pinhole is aligned with a separate set of one or more detector elements. It is also well known in the art to split a light beam and align each beam to a specific detector element in the multi-element photo-

detector, to distinctly capture the image of a sample. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the pinhole array in the microscopy system of Ueyanagi et al. in view of Krantz, to independently capture the data from each light beam to effectively form a clear microscope image.

Regarding Claim 33, Ueyanagi et al. teach the multiple source array as taught in Claim 1, according to the appropriate paragraph above. Ueyanagi et al. do not teach a microscopy system also comprising a multiple detector array, a multi-element photo-detector, and an imaging system to return electromagnetic radiation leaked to the object and scattered/reflected back through the apertures. Krantz teaches (see Fig. 15) a microscopy system comprising a source (235), multiple detector array (244',252') comprising an array of spatially separated apertures (see Col. 13, lines 33-37), multi-element photo-detector (244,252), aperture array (239) (see Col. 13, lines 40-42), and imaging system (243,251) positioned to direct a return beam to the multi-element detector, wherein the return beam comprises electromagnetic radiation leaked to the object (250) and passing through the detector array. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the multi-element photo-detector and imaging system of Ishihara with the multiple source array of Krantz, to provide a narrow-beam light source to provide a higher precision of microscopy scanning.

Regarding Claim 34, Ueyanagi et al. and Krantz teach the microscopy system as taught in Claim 33, according to the appropriate paragraph above. It is also well known in the art to split a light beam and align each beam to a specific detector element in the multi-element photo-detector, to distinctly capture the image of a sample. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the pinhole array in the

microscopy system of Ueyanagi et al. in view of Krantz, to independently capture the data from each light beam to effectively form a clear microscope image.

Regarding Claim 35, Ueyanagi et al. and Krantz teach the microscopy system as taught in Claim 33, according to the appropriate paragraph above. It is also well known in the art to use multiple aperture/pinhole arrays, to further confine the light and refine the clarity and precision of the optical system. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use another pinhole/aperture array in the microscopy system of Ueyanagi et al. in view of Krantz, to further confine the light beam scattered off the sample to obtain a more defined microscope image.

10. Claims 32 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueyanagi et al. in view of Krantz as applied to Claims 30 and 33, further in view of Balasubramanian US Patent No. 4,340,306.

Ueyanagi et al. in view of Krantz teach the microscopy system as taught in Claims 30 and 33, according to the appropriate paragraph above. Ueyanagi et al. and Krantz do not teach an interferometer to separate the source into two beams to interfere at the multi-element photo-detector. Balasubramanian teaches a microscopy system with an interferometer which separates the source into a measurement beam and a reference beam (see Col. 3, lines 21-24) and combined with the signal beam to interfere (see Col. 3, lines 24-30) at a multi-element photo-detector (25) (see Fig. 1 and Col. 3, lines 30-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the interferometer as taught by

Balasubramanian in the microscopy system of Ueyanagi et al. in view of Krantz, to provide accurate scanning of non-regular reflective surfaces (see Col. 3, lines 55-61).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (703)306-3441. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703)308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7724 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

SY

SY
December 11, 2002

DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800